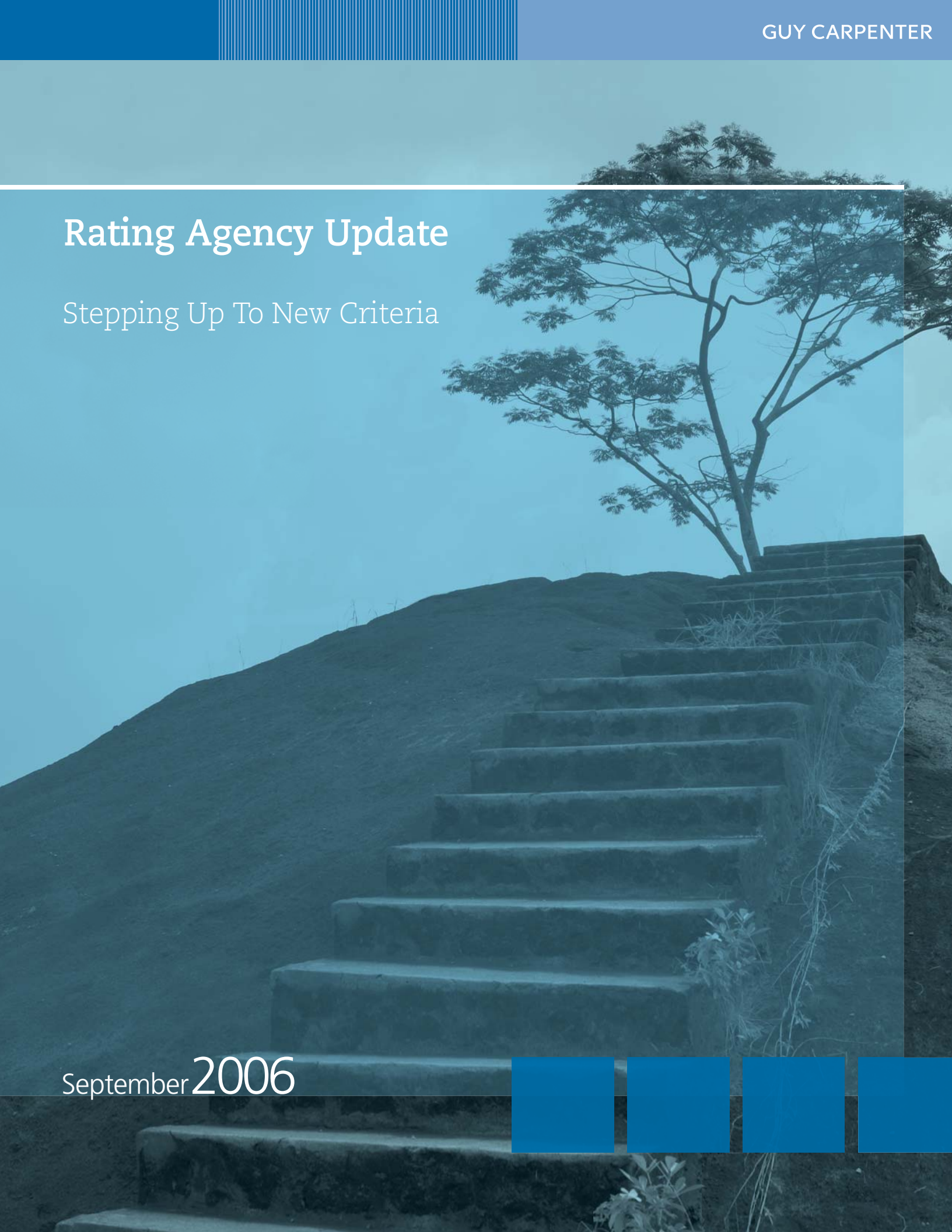


# Rating Agency Update

Stepping Up To New Criteria

September 2006



# Methodology Changes in Catastrophic Risk, Economic Capital Models and Enterprise Risk Management

## Introduction

The purpose of this report, which was prepared by Guy Carpenter's Financial Services Group and its Financial Integration Team, is to report on the latest comments from the major rating agencies on catastrophic risk, economic capital models and enterprise risk management. This document is the fifth in a series of updates regarding rating agency methodology changes, and the need to step up to the new criteria. Background information can be found on Guy Carpenter's website ([www.guycarp.com](http://www.guycarp.com)) in the "Our Insights" section, in the FSG Rating Agency Update Briefings dated December 9, 2005, March 3, 2006, April 19, 2006 and May 15, 2006.

As Guy Carpenter predicted in the December 2005 FSG Rating Agency Update, the rating agency methodology changes, coupled with model changes, have had a significant impact on the amount of capital and/or reinsurance protection needed to achieve a given rating. Given this pressure on capital, some companies have reduced exposure, some bought more reinsurance and others accessed nontraditional capital sources such as catastrophe bonds or sidecars. Guy Carpenter continues to be concerned that rating agency capital model changes combined with the updates to the catastrophe models for certain perils (such as U.S. wind) will lead to an overweighting of catastrophe risk in the required capital calculated by the rating agencies.

Guy Carpenter is committed to ensuring that there is a good exchange of quality information among the rating agencies, catastrophe modeling firms and our clients. We have met with the four major rating agencies to keep a pulse on all the latest developments including discussion of common issues and concerns as well as our expertise working with catastrophe models. Recently, Guy Carpenter hosted half-day meetings with A.M. Best and Standard and Poor's (S&P) at its New York headquarters. Topics included in-depth discussions about the agencies' use of capital models, incorporation of catastrophic risk and Enterprise Risk Management (ERM) in the rating process.

We provided the agencies with important points to consider on such issues as using aggregate vs. occurrence PMLs as well as near-medium-term vs. long-term wind frequency event sets. We also demonstrated i-aXs™, Guy Carpenter's new web-enabled data management platform, to show that Guy Carpenter's U.S. property catastrophe clients who utilize i-aXs will be able to clearly articulate their risk positions and demonstrate enhanced control of their catastrophe management process.

A summary of the latest news and methodology changes from the rating agencies follows.

## Catastrophe Risk

### Using Shorter Term Wind Event Sets

Both A.M. Best and Standard & Poor's have stated that, while they will not specify which third party catastrophe model a rated entity should use, they do expect companies to submit wind loss estimates using the five-year horizon frequency assumptions (near-or medium-term event set depending on the respective catastrophe model). Moody's will be using a short-term frequency event set in the industry exceedance curves used in its MRAC model. Fitch has not yet stated which event set it will use.

### Moody's Releases New Catastrophe Exceedance Curves

In August Moody's released new industry gross aggregate exceedance curves by catastrophe used in its MRAC capital model. A summary of the percentage changes from prior published amounts at the 1/100 and 1/250 level follow:

#### WIND

RETURN PERIOD	S. ATLANTIC WIND	GULF WIND	MID-ATLANTIC WIND	N ATLANTIC WIND
250	59%	307%	83%	24%
100	58%	305%	54%	-10%

#### EARTHQUAKE

RETURN PERIOD	NEW MADRID (1)	NEW MADRID (2)	CALIFORNIA EQ	PACIFIC NW EQ
250	65%	65%	15%	15%
100	90%	90%	0%	0%

### Terrorism Risk

Standard & Poor's released a new terrorism questionnaire in June 2006. The S&P analyst assigned to the rated company will determine whether a survey is required and the timing of the response. Although S&P will be collecting this terrorism information as part of the data used in its overall evaluation of a company, there are no plans to incorporate terrorism risk into its capital model. Over the long term, it expects to use the information to benchmark companies' terrorism exposure. Some key elements of the survey are as follows:

- > Global exposure information not just United States, for U.S. certified and non certified
- > Personal, commercial and assumed reinsurance
  - Property, workers' compensation, aviation, marine and other
  - Nuclear and biological
- > Five largest locations for a two to five-ton truck bomb, six to ten ton truck bomb, and 25-ton truck bomb (disclosing the radius inherent in the footprint).
- > Gross and net (net of deductibles and reinsurance). If a company includes TRIA recoveries in its net figures, S&P would expect to see the impact of these TRIA recoveries noted.

### Fitch – Overall Capital Needs Up 10 Percent

Fitch projected that overall capital requirements for insurers with catastrophe exposure will increase on average by 10 percent due to the changes in the catastrophe models as well as Fitch's change to TVaR (Tail Value at Risk) methodology. Embedded in these increases is an estimated 40 percent to 65 percent increase in capital specifically needed to support catastrophic risks.

As Fitch believes that companies are taking action now or will in the near future to increase current capital levels, it does not expect that ratings will be impacted in the near term due to this change in methodology. Essentially, the required capital increase has already occurred via capital increases, additional reinsurance and cat bond purchases as well as exposure reductions.

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A.M. Best – Insurer Failures  
from Mega Cat

In its special report, *Shake Rattle and Roar, 2006 Annual Hurricane Study*, dated May 2006, A.M. Best concluded that a mega-hurricane (defined as an industry event of approximately \$100 billion) would cause rating downgrades and financial impairments. Approximately 20 to 40 direct insurers or 3 percent to 7 percent of all direct writers with catastrophe exposure would be vulnerable to failure. The companies at greatest risk of impairment are thinly capitalized companies with vulnerable A.M. Best ratings (B and below) or those not rated by A.M. Best.

A.M. Best's study shows that only one event, the 1906 San Francisco Earthquake, was greater than 20 percent of the industry's surplus. This would be equivalent to an \$87 billion event today. Catastrophes with losses less than 5 percent of industry surplus cause little financial distress. Catastrophes with losses of 10 percent of industry surplus or greater result in financial failures. There were three years (1938 New England hurricane, 1992 hurricanes Andrew and Iniki and 2005 hurricanes Katrina, Wilma and Rita) in which the storm damage was between 10 percent and 20 percent of industry surplus. So far, these events resulted in financial failures of ten, sixteen and four insurers, respectively.

## Rating Agency Capital Adequacy Models

In addition to catastrophic risk, S&P and Fitch have announced significant changes to their economic capital models, which are described below. A.M. Best is in the process of updating its BCAR model factors to be utilized for BCAR calculations during 2007. In addition, A.M. Best had added increased stress testing for natural and manmade catastrophes, which was discussed in detail in previous briefings. Moody's recently released a revised version of its capital model, the most significant change was related to catastrophic risk.

### Standard & Poor's

S&P announced some of the changes anticipated to its capital model (S&P CAR). Key elements are as follows:

- > S&P CAR will remain a static model and not stochastic.
- > Model changes are not expected to lead to rating changes immediately but may, perhaps, in the intermediate term if a company's capital management strategies do not address any deficiencies identified.
- > Previously, the calculation of the total adjusted capital component of S&P CAR began with statutory surplus. This practice will continue for companies evaluated on a U.S. statutory basis. For companies evaluated on a GAAP or IFRS basis the calculation of total adjusted capital will begin with shareholders' equity.
- > Changes will be made to asset risk factors, reinsurance recoverable factors, pricing risk factors and reserve volatility factors.
- > The catastrophe PML will be based on the assumption of higher frequency and severity, specifically the near-medium-term catalogue of events.
- > There will be no quantitative credit for diversification, only qualitative.
- > S&P will now estimate an amount of capital required for a given rating rather than expressing a company's capital adequacy as a ratio compared to a benchmark.
- > These anticipated changes will be tested in July and August, and S&P will publish the proposed factors and solicit feedback over a three-month period. The model changes will be finalized in the fourth quarter of 2006. Both versions of the model will be run in 2007.

### Fitch

Fitch has created a new in-house, simulation-based economic capital model called Prism. Some of the key elements follow:

- > The risk elements modeled include:
  - ALM (Asset Liability Matching, including market value and interest yield risk)
  - Credit
  - Reserve
  - Underwriting

- > Natural catastrophe modeling for both primary insurers and reinsurers will be property focused. The catastrophe PML will be based on TVaR measurement using the aggregate loss curve. The specific TVaR percentile has not been determined yet.
- > Operational risk will be included using a 5 percent to 15 percent load on required capital. The percentage will be determined judgmentally.
- > The impacts of diversification and correlation will be included.
- > The model output for required capital for a specific rating level will be compared to available capital. The definition of available capital will be released in the third quarter of 2006.
- > After beta testing, rated companies will receive, via their analyst, detailed model output and the critical assumptions and adjustments.
- > Results from Prism will be an important part of the rating process, but Fitch has not stated a specific weighting.

## Usage of Companies' Own Economic Capital Models

Each of the four major rating agencies has now acknowledged the merits of incorporating, at some level, the results of companies' own economic capital models. To "give credit" for a company's own economic capital model, the rating agencies expect the models to pass the following tests.

<b>QUALITY TEST</b>	The model is disclosure-ready, transparent, and the model and its results can be explained by management. The model must be sufficiently sophisticated and have all major risks incorporated. The data and model must be checked, validated and controlled. The model should have predicted actual results well.
<b>ASSUMPTION TEST</b>	Assumptions and related stress testing must be deemed appropriate by the rating agency. One important area is the comparison of model assumptions with the company's peers.
<b>USE TEST</b>	The model and its results must be well integrated into a company's day to day risk management process. Management must rely on the model results to make decisions. If the model indicates that a company is over exposed to certain risks, management should be able to show that it took action to mitigate those risks.

Given that the agencies are comfortable with the criteria described above, each agency will give credit in the rating process as follows:

- > A.M. Best will use a subjective weighting between the company's own model and BCAR when evaluating capital adequacy.
- > If a company's ERM process is rated strong or excellent, S&P's view of capital adequacy will be quantitatively influenced by giving some credit for diversification benefits implied by the company's own model. The precise methodology has not yet been determined. S&P will release additional information on the incorporation of a company's economic capital model into S&P's ratings by the end of 2006.
- > Moody's will use the output from a company's own model alongside its more established capital measures when forming a view of capital adequacy.
- > Fitch will subjectively weight capital generated from a) Prism (Fitch's new capital model) results, b) a company's own economic capital model and c) regulatory capital requirements (the amount of capital in excess of the regulatory minimum).

None of the agencies will require companies to have economic capital models. However, to obtain a strong or excellent ERM rating from S&P, a company will have to have an economic capital model.



## Enterprise Risk Management

Each of the four major rating agencies has now acknowledged the need to consider a company's ERM in the rating process. S&P was the first agency to announce detailed criteria and review procedures, which are described in Guy Carpenter's briefing dated December 9, 2005. A.M. Best followed with some comments described in the FSG briefing dated March 3, 2006. Fitch and Moody's are expected to be publishing their views on insurance company ERM during 2006. Appendix B contains a comparison of the rating agencies' approaches to ERM.

### Standard & Poor's

As of May 2006, S&P had rated ERM for 78 insurance companies globally, including primary companies and reinsurers in the property casualty, life, and health sectors. A summary of the ratings results and related discussion items from S&P follow.

ERM RATING	PERCENTAGE OF RATED COMPANIES
Weak	6%
Adequate	62%
Strong	24%
Excellent	8%

- > To date, not all of the ERM ratings above have been published in the respective company's Full Analysis Ratings Report
- > Most of the ERM ratings have been "Adequate", and most have had a neutral impact on the overall rating.
- > Within the underwriting/insurance risk control area, a company's procedures for cycle management are a key discussion point.
- > When a company uses a third party to provide services within one of the key control areas, such as extreme events management, the rating for that control area may initially drop a notch. After discussions with the rated entity, if the third party is actively managed and is treated like another department of the entity, then the rating would be reinstated.
- > Small companies are not exempt from needing risk management requirements, as it is the complexity of the risks, not the size that matters.
- > A component in the strategic risk management area is optimizing risk-adjusted results. A company must decide where on an efficient frontier it would like to be (risk vs. return trade off) and then manage to it. One example is a mutual company for which capital preservation and longevity are more important than high returns.

### A.M. Best

A.M. Best will be publishing additional guidance on ERM in the fall of 2006. During 2006 ERM has been added as an agenda topic for company meetings. A.M. Best is looking for management to answer the following questions:

- > To what extent does your company engage in risk management?
- > Are risks evaluated in an integrated framework?
- > What is your company's risk appetite?

- > What are your company's five largest risk scenarios? How are these risks monitored?
- > How does the company handle risk in its infrastructure and systems?
- > How does the company manage catastrophe risk? Are models used? How good is the underlying data? Does the company perform scenario testing?
- > How are geographic, regulatory, legislative and judicial risks handled?
- > How does the company govern and control these risk exposures?
- > Are these risks correlated?

These questions are open-ended and may be interpreted and answered in different ways. A.M. Best has done this intentionally to obtain an understanding of how each company views risk.

## Conclusion

Guy Carpenter will continue to work to address our clients' concerns and monitor developments at the rating agencies and communicate any updates. If you have any questions or require additional information regarding the concepts detailed in this report, please contact your Account Executive or one of the Guy Carpenter specialists listed below.

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A.M. Best, Catastrophe Analysis in A.M. Best Ratings, November 2005, Revised April 2006.

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## Appendix A

### COMPARISON OF RATING AGENCY TREATMENT OF NATURAL CATASTROPHIC RISK

CATEGORY	A. M. BEST <sup>(1)(7)</sup>	STANDARD & POOR'S <sup>(2)(3)(7)</sup>	FITCH <sup>(4)(5)(7)</sup>	MOODY'S <sup>(6)(7)</sup>
Adjustment to Actual Capital or Target Capital for Catastrophic Risk Exposure	Adjusted actual capital reduced for the higher of the 1/100 wind or the 1/250 earthquake net PML (occurrence basis)	Target capital increased for net 1/250 net PML (aggregate basis)  Net of one year's catastrophe premiums written less 30% for expenses	Target capital includes an amount based on tail value at risk (TVaR) from the catastrophe loss exceedance curve. The TVaR thresholds have not yet been determined but will vary based on a company's rating level.	Target capital in simulation iterations include amounts generated from random draws of exceedance curves for 7 U.S. catastrophes. Overall required capital is set at the enterprise loss amount at the 1/1000 return time.
Measurement	Event	Aggregate	Aggregate	Simulated events
Modeling Horizon Assumption	5 year horizon (medium or near term depending on catastrophe modeler)	5 year horizon (medium or near term depending on catastrophe modeler)	Waiting to see the impact of the near/medium term frequency assumptions on some companies before making determination	5 year horizon (medium or near term depending on catastrophe modeler)
Coverages & Perils Included in Loss Estimates	Coverage: Property structure and contents, additional living expenses, business interruption, flood, auto/motor physical damage, workers compensation, energy, ocean marine, inland marine and crop.  Perils: Hurricane, earthquake, tornado, hail.  Additional information requested for 1/50 and 1/500 for hurricane, earthquake, tornado/hail and winter freeze	Coverage: Global property  Perils: All  Additional regional all perils and by peril information is requested at the 1/10, 1/20, 1/50, 1/100, 1/250 and 1/500 levels. For U.S. and European companies Hurricane (wind), flood (non-US), earthquake, tornado, hail is requested. For Australia and Japan primary companies all perils is requested. For reinsurers, Wind, Tornado/Hail and Earthquake is requested for 14 zones	Coverage: Property  Perils: Hurricane (wind) and earthquake	Coverage: Property (including workers comp for earthquake).  Perils: South, mid and north Atlantic wind, gulf wind and new Madrid, California, Pacific Northwest earthquake  In addition to what is used in MRAC, Moody's also looks at company specific information including exceedance and aggregate information and event sets. Moody's requests data on aggregate exposure for each region/peril and loss exceedance numbers for aggregate all perils 1/50, 1/100, 1/250, 1/500 and 1/1000 for regions/perils. These are not used in MRAC which uses standard industry curves, but are used elsewhere in the rating process.
Components of Loss	Demand surge, storm surge, fire following earthquake, secondary uncertainty and loss adjustment expenses	Demand surge, storm surge, fire following earthquake, sprinkler leakage and secondary uncertainty	As Fitch is using its own bespoke stochastic model, the company's results may be adjusted by rating analyst (all switches to be turned on)	All switches are turned on (demand surge, storm surge, secondary uncertainty and fire following)
Reinsurance Assumption in Catastrophic Risk Change	Net of reinsurance, plus reinstatements and co-participations	Net of reinsurance, plus reinstatements and co-participations	Net of generic or company specific reinsurance (if companies provide information)	Assumes 90% cession for losses between the 1/25 to 1/100 level
Tax	Post-tax	Pre-tax	Modeled pre-tax with later scope for adjustment	Pre-tax
Credit Risk Impact	Stress test adds credit risk charge by applying the credit factor to 80% of ceded reserves from first event and by assuming one level downgrade	Potential material increases in reinsurance recoverables taken into account (analyst discretion)	Under development	Ceded losses are considered reinsurance recoverables and added to reinsurance risk
2nd Event Stress Test	Calculate a stressed BCAR including a 2nd net catastrophe PML at the higher of the 1/100 wind or the 1/100 earthquake	Believed to be not applicable as aggregate net PML information is used	Believed to be not applicable as aggregate net PML information is used	Adds randomly generated catastrophes from the seven areas so this includes multiple events, but not necessarily second event in same region or peril
Underwriting Risk Change	None	Underwriting risk factor is reduced between 0% and 50% to avoid for double counting catastrophic risk (default reduction is 5%)	Under development	None

<sup>1</sup> A.M. Best, *Catastrophe Analysis in A.M. Best Ratings*, November 2005, Revised April 2006

<sup>2</sup> Standard and Poor's, *Insurance Criteria: Catastrophe-Specific Capital Charges To Be Extended to Primary Insurers, But Reinsurance Criteria Unchanged*, November 7, 2005

<sup>3</sup> Standard and Poor's, *Reinsurer Criteria: Larger Losses And Better Modeling Prompt Changes To Property Catastrophe Criteria*, June 27, 2005

<sup>4</sup> Fitch Ratings, *Special Report: New Thinking on Catastrophic Risk and Capital Requirements*, November 9, 2005

<sup>5</sup> Fitch, *Criteria Report, Exposure Draft: Capital Assessment Methodology and Model (Prism) – Executive Summary*, June 2006

<sup>6</sup> Moody's, *Rating Methodology: Risk Adjusted Capital Model For Property & Casualty Insurers*, September 2004

<sup>7</sup> *Conversations with the Rating Agency*

## Appendix B

### COMPARISON OF RATING AGENCY APPROACHES TO “ENTERPRISE RISK MANAGEMENT”

CATEGORY	A. M. BEST <sup>(1)(7)</sup>	S&P <sup>(2)(3)(4)(7)</sup>	FITCH <sup>(5)(7)</sup>	MOODY'S <sup>(6)(7)</sup>
Separate Rating Category	No (implicitly considered) within Capital Strength, Operating Performance and Business Profile categories)	Yes	No	To be determined
ERM Rating	Not applicable	Yes (Excellent, Strong, Adequate or Weak)	Not applicable	Developing Risk Management Assessment reports that will characterize ability as strength, neutral or weakness
Paper on ERM	1st paper February 2006, expected additional criteria to be issued September 2006	Original in October 2005, preliminary results May 2006 and revised in June 2006. More detail use on companies' own models to be released by end of 2006.	To be released 3rd quarter 2006	April 2006 presentation at ERM symposium. Insurance ERM to be released by end of 2006
Consideration of ERM in Ratings Process	Already considered part of its procedures in evaluating Capital Strength, Operation Performance and Business Profile	Extent of consideration depends in part on company's abilities to absorb risks and its complexity of risks	To be determined	Meeting with companies to discuss its ERM process and will then determine how ERM will be incorporated into its rating methodology. Have developed Gold Benchmark standards for risk governance, risk management, risk measurement, risk intelligence
Changes Expected in Overall Ratings due to ERM Consideration	No	No	No	To be determined
Use of Company's Own Economic Capital Model	Will consider	Will consider	Will consider	Will play an increasingly important role in ratings
Use of Company's Own Economic Capital Model Depends On	Management understanding of model Extent relied on for decisions Perceived quality of model Predictive capability Company's overall risk management program,	By end of 2006 S&P will determine when they will rely on a company's own economic capital model, however, such models will only be considered if ERM rating is better than adequate.	Amount of capital in excess of regulatory minimum Extent relied on for decisions Perceived quality of model Predictive capability	Fully embedded, sophisticated model could become a positive rating factor  Must be clearly demonstrable part of day to day risk management and capital decisions
Weighting of Models	Best will determine weight between BCAR and company's own model	To be determined	Fitch will weight subjectively between PRISM, Company's own model and regulatory capital requirements	To be determined

<sup>1</sup> A.M. Best Special Report: A.M. Best Comments On Enterprise Risk Management And Capital Models, February 2006

<sup>2</sup> Standard and Poor's, Insurance Criteria: Summary Of Recent Enhancements To Insurer Enterprise Risk Management Criteria, June 2, 2006

<sup>3</sup> Standard and Poor's, Insurer Criteria: Refining the Focus Of Insurer Enterprise Risk Management Criteria, June 2, 2006

<sup>4</sup> Standard and Poor's, Insurer Criteria: Evaluating The Enterprise Risk Management Practices Of Insurance companies, October 17, 2005

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<sup>6</sup> Moody's Special Comment, Company Built Internal Capital Models Expected To Play Greater Part In Moody's Insurance Rating Process, June 2006

<sup>7</sup> Conversations with the rating agencies

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